MODEL DESCRIPTION

NON-RECURRING COST MODEL

Version 2.2

Model Description

TABLE OF CONTENTS

List of Attachments

A. Non-Recurring Types
B. Detailed Work Activities
C. Activity Assignment Table (provided in a separate attachment)

I. OVERVIEW

The *Non-Recurring Cost Model (NRC Model)* develops one time (non-recurring) cost estimates for the tasks and activities that may be performed by an Incumbent Local Exchange Carrier (ILEC) when a Competitive Local Exchange Carrier (CLEC) requests wholesale services, interconnection, and/or unbundled network elements.

Utilizing a forward looking cost methodology, the *NRC Model* develops a "bottoms-up" estimate of non-recurring costs. The NRC Model reflects the individual OSS tasks and activities that may be required to respond to a CLEC request. To the extent feasible, each component has been separately costed.

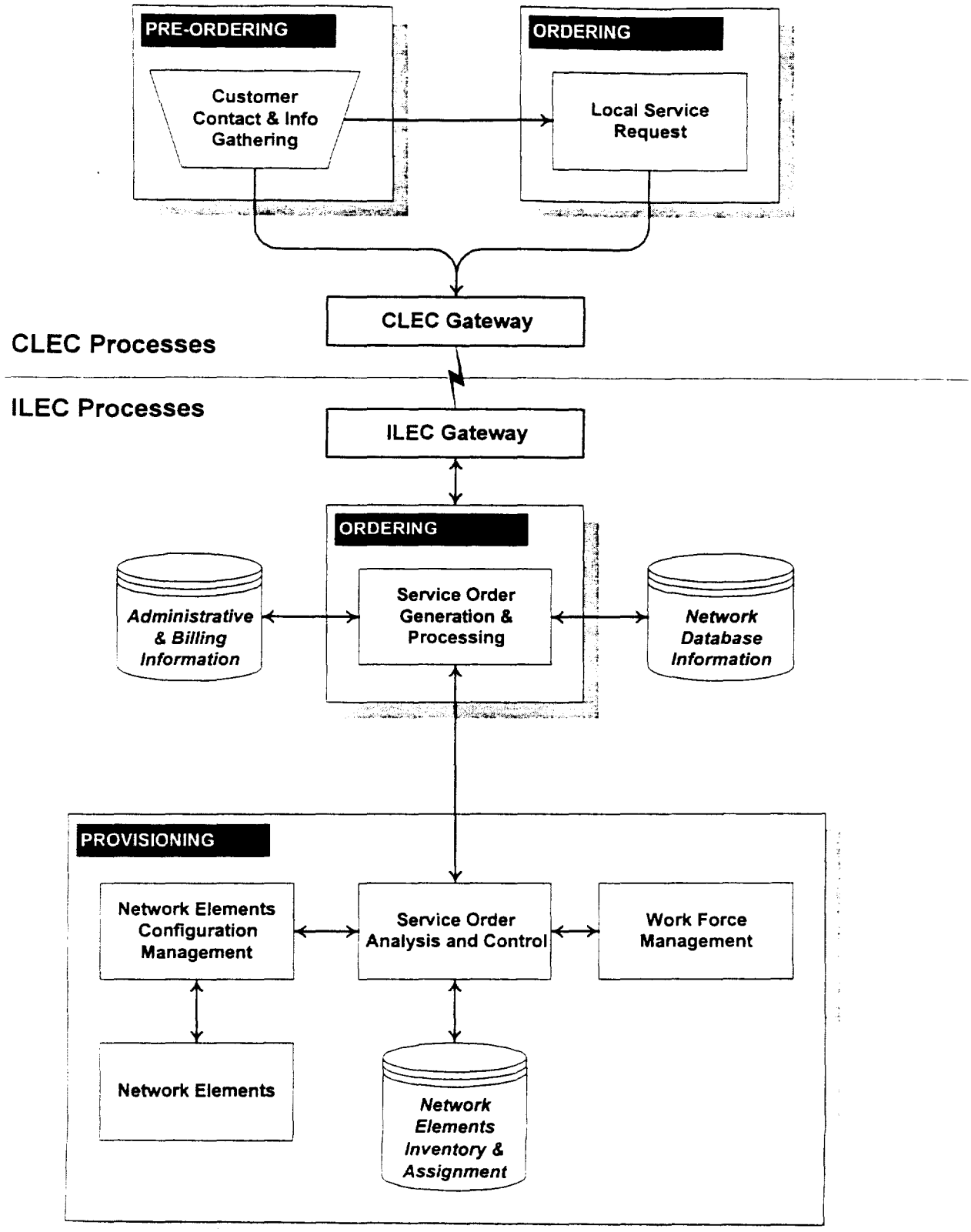
The majority of non-recurring element types involve activities associated with the pre-ordering, ordering and /or provisioning process. A short description of these processes follows:

Pre-ordering: The process by which a CLEC interfaces with customers to determine customer needs. A CLEC and ILEC exchange necessary information to initiate orders. This information, such as customer premise address, phone number availability, feature availability and service availability is made accessible to CLECs electronically so they can accurately respond to customers when taking service and feature orders.

Ordering: The process by which a CLEC electronically submits a Local Service Request (LSR) to an ILEC via an electronic gateway. The ILEC responds electronically with a positive confirmation of order acceptance.

Provisioning: The process by which an ILEC, after receipt of an LSR order, performs the necessary functions to provide the service, interconnection, or Unbundled Network Elements (UNE) requested by a CLEC.

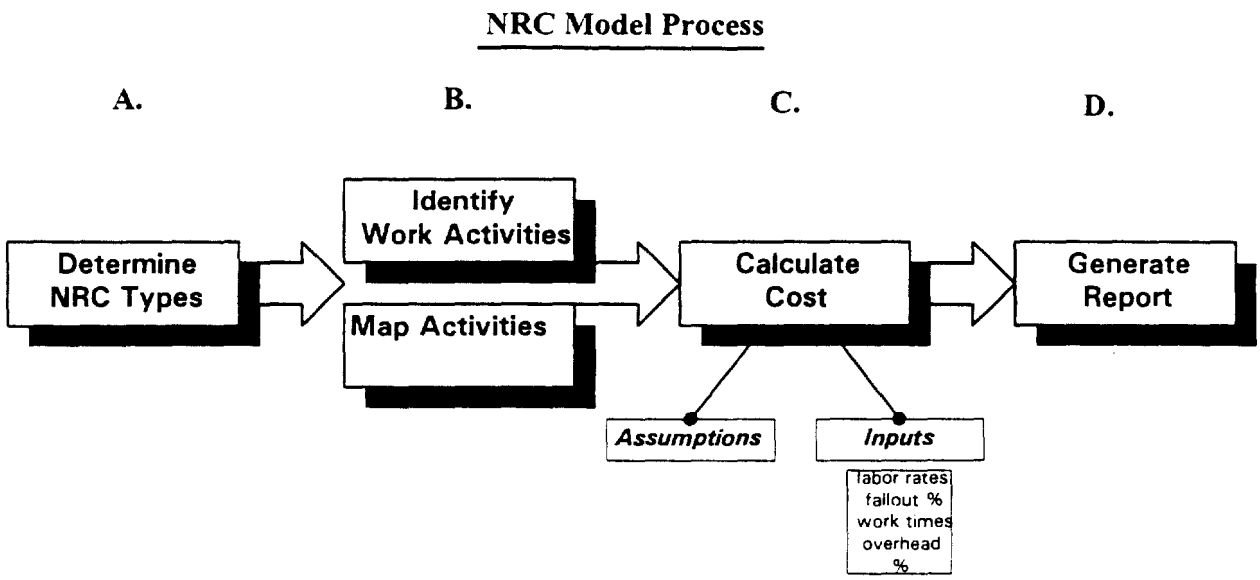
These processes are depicted in the high-level chart on the next page.


PRE-ORDERING
Customer Contact & Info Gathering
ORDERING
Local Service Request
CLEC Gateway
CLEC Processes
ILEC Processes
ILEC Gateway
ORDERING
Administrative & Billing Information
Service Order Generation & Processing
Network Database Information
PROVISIONING
Network Elements Configuration Management
Service Order Analysis and Control
Work Force Management
Network Elements
Network Elements Inventory & Assignment

In summary, the *NRC Model* provides a detailed step-by-step understanding of the systems required and the manual work activities performed by an ILEC in the ordering and provisioning of wholesale services and unbundled network elements. The model is designed to reflect the most efficient management and operations of existing ILEC OSSs.

II. METHODOLOGY

As shown by the following chart, the *NRC Model* develops costs in four distinct stages:



A. Determine Non-Recurring Cost Element Types:

The NRC element types that were initially selected for calculation by the model were developed based on a review of the charges proposed by ILECs during negotiation and arbitration proceedings. These NRC element types consist primarily of functions performed in the provisioning of service to existing customers (migration)[1] and to new

1 Migration is defined as moving existing ILEC customers to a CLEC.

customers (installation)[2]. The following element types have been added to the NRCM (Version 2.2);

- *"DS1 Interoffice Transport Disconnect"*
- *"DS3 Interoffice Transport Disconnect"*
- *"DS3 Loop to Customer Premise Migration"*
- *"DS3 Loop to Customer Premise Install"*
- *"DS3 Loop to Customer Premise Disconnect"*

The *Telecommunication Act of 1996* explicitly allows new entrants to provide local telecommunication services by means of various connectivity options. To the extent these options cause different costs to be incurred, such costs are modeled separately within the NRC Model. The local connectivity options include:

Total Services Resale (TSR): ILEC acts as a wholesaler of local telephone service which the CLEC then resells to end user customers.

Unbundled Network Elements Platform (UNE-P): CLEC purchases unbundled network elements in combination from the ILEC at cost-based rates.

Unbundled Network Elements (UNE): CLEC purchases individual unbundled network element(s), e.g., unbundled network element-loop (UNE-Loop), from an ILEC that may be used alone or in combination to provide telecommunication services to CLEC end user customers.

One example of an element type developed by the *NRC Model* is element type 3: *"POTS/ISDN BRI Migration (UNE Platform)"*. This element type represents the situation where an existing POTS or ISDN customer changes it's local service provider from an ILEC to a CLEC, and the CLEC serves the customer by purchasing the unbundled network elements in combination (UNE-P).

See **Attachment A** for a complete list of the NRC element types included in the model. Within the model, the user has the ability of either costing individual element types or batch processing a user selected list of element types all at once.

---

2 Installation is defined as the establishment of service for a CLEC customer that is not currently served by an ILEC. Service may be for an existing or new customer premise.

B. Identify and Map Activities:

The *NRC Model* identifies the individual systems utilized and manual work activities performed, when an ILEC provides a non-recurring service. These activities are considered generic for the ILEC and fall primarily within the pre-ordering, ordering and provisioning processes. There have been 225 steps identified and captured in the model (202 steps reflect work activities and the remaining 23 steps reflect categories in which these steps are grouped). See **Attachment B** for a complete list and description of the activities included in the model.

The model then maps the appropriate set of work activities to each NRC element type. For example, to migrate a POTS customer under the UNE-P option, requires nineteen identified work activities. The logic of the *NRC Model* maps these activities to the NRC element type through an assignment table contained on the "*Process & Calcs*" sheet of the *NRC Model.*

As demonstrated in the following table excerpt, activity assignment is made by the placement of an "X" at the table intersection of activity and NRC element type. (Note: while some activities are generic to many NRC element types, others are specific to only a few.)

ID No.	Process Flow / Activity	1 POTS / ISDN BRI - Migration - TSR	3 POTS / ISDN BRI - Migration - UNE - Platform	49
1	***Pre Order Steps***	X	X	
2	CLEC customer contact	X	X	
3	CLEC requests customer address data, CSR, and appointment from ILEC	X	X	
4	ILEC gateway requests address data from Administrative Information System and CSR	X	X	
5	ILEC gateway formats and returns address, CSR, and appointment data to CLEC			
6	***Ordering Steps***	X	X	
7	CLEC customer service representative inputs LSR information into LOS	X	X	
8	ILEC gateway receives, validates and logs LSR, returns FOC, and passes LSR to SOG	X	X	
9	CLEC gateway sends LSR to EXACT			
10	ILEC SOG retrieves CSR data, formats and passes to SOP	X	X	
11	***Provisioning Processing Steps***	X	X	
12	EXACT and TUF sends request to SOP			
13	SOP sends request to SOAC	X	X	
14	SOAC analyzes order, generates assignment requests for OSP, COE, IOF, etc.	X	X	
....				

Description

When a user of the model chooses to cost out a particular NRC element type, the model selects the column corresponding to that NRC element type and looks for the activities that are required to be performed. If an "X" is shown, the activity in that row is required. In the table shown above, for example, a *POTS Migration* under the TSR connectivity option requires steps 2, 3, 4, 7, 8, 10, 13, and 14. (Note: this is only a sample of activities required for this element type). In addition, an "X" also appears in steps 1, 6, and 11 in order to display the specific categories the steps belong to.

For each activity described above, the model incorporates costing inputs. These inputs include the probability of the activity's occurrence, the time to complete the work activity, and the labor rate associated with the work activity. The model then calculates the cost of each individual activity based upon these inputs and model assumptions. For a complete list of the activity assignment table, see Attachment C.

C. Calculate Costs:

The third stage of the model calculates the cost of each activity and process. The *NRC Model* uses advanced features of Microsoft Excel 7.0 including Visual Basic for Applications (VBA) macros and dialog boxes. The User Guide, which is a separate document, contains additional information on how to run the model.

Through the use of "drop-down" input screens, the model provides the user with alternative input feeds that impact non-recurring service costs. These input screens include the following:

NRC Model - Control Panel: Prompts the user to select NRC element type and state.

Customize Batch: Allows the user to exclude elements from a Batch Run Scenario.

Manual Labor Rates: Prompts the user to either accept or override default values for the input labor rates.

Other NRC Model Inputs: Prompts the user to either accept or override default input values for the following *NRC Model* inputs. (Note: the Assumptions and Inputs of the model are described in more detail later in this document)

- Copper Loop Percentage
- Central Office Staffing Ratio (% of lines served via staffed central offices)
- Average Trip Time
- Average Setup Time
- Work Activities per Order (in central office)
- Percentage Dedicated Facilities
- Variable Overhead (%)

Description

- POTS System Fallout
- Complex System Fallout

After the user has selected an element type, and has accepted or adjusted any of the default inputs, the model selects all of the activities associated with that particular non-recurring element type based upon the assignment table. Once these activities are selected, the model calculates the cost of each activity using the following formula:

Activity Cost = (Activity Probability (%) x Time (minutes)) x Rate ($ per hour) / 60

The chart below demonstrates how the model performs this step:

A	B	C	D = (A x B x C) / 60	
Probability	**Time**	**Rate**	**Cost w/out Overhead**	
(%)	**(minutes)**	**($/hour)**	**($)**	
NA				
100.0%	-	R	$	-
NA				
100.0%	-	R	$	-
40.0%	2.50	36.64	$	0.61
2.0%	20.00	36.64	$	0.24
40.0%	0.25	36.64	$	0.06
40.0%	2.00	36.64	$	0.49
40.0%	0.25	36.64	$	0.06
40.0%	1.50	36.64	$	0.37
2.0%	-	R	$	-
2.0%	2.50	33.87	$	0.03
2.0%	15.00	33.87	$	0.17
60.0%	-	R	$	-

As reflected above, an assumption in the model is that forward looking OSS investments and system processing costs should be recovered in competitively neutral recurring rates as opposed to non-recurring rates. Therefore, the costs of these activities are set to zero by the placement of an "R" in the *Rate* input field.

Finally, the model sums the costs of all appropriate activities for each element type and then applies the user defined "overhead factor" to arrive at the total cost of providing the element.

D. Generate Results

After all calculations have been completed, the model populates the results into a table. NRC element types that are run individually are output by the model as follows:

NRC #	Alabama - NRC Elements	Total Cost		Total Cost	
1	POTS / ISDN BRI Install (UNE Loop)	$ 1.90	<-- with overhead	$ 1.72	<-- without overhead

When results are run in batch mode, the model outputs the cost of each NRC element type generated by the model in a single table.

III. Assumptions

This section provides a description of the general assumptions (technical and otherwise) used by the *NRC Model.*

A. Efficient Operations Support Systems

The *NRC Model* assumes the existence of OSSs which are operated efficiently by the ILEC. Such systems are automated and mechanized today, and should be capable of handling all movement of data electronically between other systems and databases.

The *NRC Model* OSSs are defined by the following minimum criteria:

- All databases are updated on a timely basis, regularly maintained for maximum performance, and are consistent with each other
- OSSs are appropriately sized and electronically linked
- OSSs use front-end edits to minimize the possibility that erroneous information is entered
- OSSs rely on the latest software releases and reside on high availability platforms

In addition, the environment in which the *NRC Model* OSSs are operated is defined by the following:

- No network exhaustion is assumed
- To the extent problems occur, the ILEC will pro-actively conduct a proper root cause analysis and will implement changes to eliminate the problem
- CLECs will have access to these OSSs via an electronic interface
- Work throughput is efficiently planned (i.e., POTS and ISDN BRI-type services should not be classified as designed circuits. Such a classification is unnecessary, does not mirror ILEC procedures, and drives up costs.)
- Company personnel are adequately trained
- The deployment of the latest data communications network technology

B. Recovery of Operations Support System Investment

The *NRC Model* assumes that the costs of the underlying OSSs (i.e., hardware, system software, and processor costs) should be recovered in the LEC's recurring wholesale and retail rates.

In general, OSSs are not developed or partitioned to support only one class of customer, such as a CLEC, nor are they established to support a particular set of functions, such as non-recurring functions. Instead, the architecture of OSSs today is designed to manage the totality of the LEC's telecommunication network, with individual systems and databases reliant on each other for optimal integrity.

In the FCC's order in Docket 96-325, a recurring cost was defined as one that is incurred periodically overtime.[3] OSS development is predicated on the assumption that the OSS will have a life-span of several years. To properly recover this investment in a one-time charge would require a precise present value calculation to prevent over or under recovery of this cost. However, the FCC has found that, "in practice, the present value of the recurring costs cannot be calculated with sufficient accuracy to warrant up-front recovery of these costs".[4]

---

3 FCC Order 96-325, paragraph 745. First Report And Order - Released: August 8, 1996

4 Ibid., paragraph 746.

The FCC has concluded that:

> "imposing non-recurring charges for recurring costs could pose a barrier to entry because these charges may be excessive, reflecting costs that may (1) not actually occur, (2) be incurred later than predicted; (3) not be incurred as long as predicted; (4) be incurred at a level that is lower than predicted; (5) be incurred less frequently than predicted; and (6) be discounted to the present using a cost of capital that is too low."[5]

Further, OSS investments, like switching and loop investments, produce long term assets, the recovery of which should, like the recovery of switching and loop costs, be amortized over the life of those assets.

C. Electronic Fallout

Fallout refers to errors in an electronic flow-through process. For example, in an electronic ordering process, if one of the OSSs receives erroneous or incompatible information from another OSS, the order will "fallout" of the electronic process and may require manual intervention to correct or complete the order.

Fallout is important because in many instances it is the only cost-driver for an otherwise seamless electronic flow-through process. In the absence of fallout, many processes would only have systems processing costs, costs which should be recovered via competitively neutral recurring rates.

There are four major categories of electronic fallout.

1. Database synchronization errors
2. Network element denial
3. Communication errors
4. Synchronization Errors

Database synchronization errors occur when databases that contain identical data do not match, or they disagree as to the availability or status of a needed resource. Typical database synchronization errors that fallout include street names that exist in one database that are not duplicated in other databases. Another example is when facilities marked as 'spare' in one database are not reflected as available in another database.

---

5 Ibid., paragraph 747.

Description

Network element denial is a second type of fallout. It can happen when an Intelligent Network Element (INE), such as a Local Digital Switch, responds that it cannot perform a task requested by another component of the network for whatever reason. For example, the element management system might believe that a certain version of software is available to activate certain features, when in reality the installation of this software has not yet been performed.

Communication errors represent the failure of the communication links between OSS, the Element Management Systems (EMS), and/or the INE. These errors take place because a valid communication path cannot be found between the elements.

Synchronization errors occur when two separate components (OSS to OSS or OSS to EMS & INE) attempt to communicate, but fail to establish the necessary communications protocols, even though the link is functioning.

Of the four categories of fallout, the error that occurs most often is database synchronization error. The degree of fallout from these four categories can and should be minimized by properly maintaining the OSS databases and the telecommunication network.

In determining the input values for fallout, in both a simple (POTS) and complex environment, the NRC Model draws upon industry experience and comparable industry information[6]. Relying on the assumption of efficiently operated OSSs and processes, the default fallout rate utilized in the NRC Model is 2%. This is further supported in Bellcore GR-22869, where according to Section 4.6.2 (Immediate Service Activation) "Activation will occur at the time of assignment"(i.e., immediately)[7]. This variable is user adjustable for both POTS and complex fallout.

---

[6] Southwestern Bell recently indicated in its Texas filing that their EASE system, which services residential lines, has a fallout rate of 1% (transcripts; Open Meeting Prehearing Conference- 6/24/97- Southwestern Bell before the P.U.C. and A.L.J.) In addition, US West states in a cost study filed before the Minnesota Public Service Commission on 7/11/97 that "97% of all CSB PIC Changes are completely mechanized."

[7] Bellcore GR-2869, Issue 2, (Oct. 1996) pg. 4-25, section 4.6.2

D. Labor Rates

The labor rates used by the *NRC Model* represent a fully assigned rate, which includes wages and benefits for first-line supervision through third level management. In addition, the labor rate accounts for non-productive time, overtime pay, clerical support and other miscellaneous expenses. Finally, labor rates have been developed and applied for 14 different job classifications in order to account for the varying levels of labor costs incurred by different work centers and process activities.

When available, union contract labor rates are used as the foundation for developing the appropriate rates. Since data was not readily available to derive average rates by adjusting for pay zones and wage progression, the top pay zone represented by the union contract for each state is used for all rates, thereby assuming that the entire work force is at the maximum rate within their pay band.

The particular job classifications used in the *NRC Model* were identified by reviewing individual work activities included in the model. This information, when combined with knowledge of job descriptions, job function codes, union contracts and information drawn from publicly available cost studies, enabled the identification of the following technical titles to be used in the model:

- Business Dispatch Administration Center (BDAC)
- Consumer Dispatch Administration Center (CDAC)
- Circuit Provisioning Center (CPC)
- Customer Service Center (CSC)
- Frame Control Center (FCC)
- Facility Maintenance Administration Center (FMAC)
- Special Services Installation & Maintenance / Outside Plant (S S I&M / OSP)
- Loop Assignment Center (LAC)
- Network Terminal Equipment Center (NTEC)
- Recent Change Memory Administration Center (RCMAC)
- Switching Control Center (SCC)
- Special Service Center (SSC)

Description

- Splicing
- InterLata Carrier Service Center (ICSC)

Publicly available cost models suggest that benefits generally equate to approximately a 33%-35% increase over the contract labor rates. The *NRC Model* uses a 40% benefits loading to provide a conservatively high cost estimate. The first through third level management salaries and benefits were calculated and loaded on to the labor rates based on a ratio of 15:1 for contract to supervisory personnel, and 5:1 for the next two layers of management. The salary and benefits for one clerical position were also incorporated.

The loaded hourly rates were inflated by 23% to represent productive hourly rates. This includes paid time off for vacations, holidays, personal days, training, coffee breaks, etc. Miscellaneous expenses were added to cover such items as travel expense, training, and office supplies. Finally, another increment was added to cover premium pay for overtime worked.

Provided below is an example of the labor rate calculation.

Wage Rate Components	Input	Hourly	Cumulative	Derivation
Basic wage rate		$20.00	$20.00	Union contract
Benefits loading	40%	$8.00	$28.00	Subject matter expert
Non productive time loading	123%	$6.56	$34.56	2080 paid hrs / 1685 prod hrs
Overtime loading		$1.78	$36.34	$3000 annual overtime / 1685 prod hrs
Miscellaneous loading		$1.19	$37.53	$2000 annual misc exp / 1685 prod hrs
First line supervisor salary w/benefits	$75,000			SME estimate
First Level hourly w/benefits	$36.06			Salary & bene / 2080 paid hours
First Level hourly		$2.40	$39.94	1st level sal & bene / 15 reports
Second level mgmt. ave. salary w/benefits	$105,000			SME estimate
Second level hourly w/benefits	$50.48			Salary & bene / 2080 paid hours
Second Level hourly		$0.67	$40.61	2nd level sal & bene / 75 reporting people
Third level ave. salary w/benefits	$135,000			SME estimate
Third level hourly w/benefits	$64.90			Salary & bene / 2080 paid hours
Third level sal. (Hr.) divided by 375		$0.17	$40.78	3rd level sal & bene / 375 reporting people
Support Clerk ave. salary w/benefits	$51,800			SME estimate
Support clerk hourly w/benefits	$24.90			Salary & bene / 2080 paid hours
Support clerk sal. (Hr.) divided by 375		$0.07	$40.85	Support clerk sal & bene / 375 people

E. Work Times

Work time estimates are associated with various activities. The work time estimate is the average amount of time required to perform a particular work function. These work time estimates were obtained from a panel of subject matter experts or other sources and are included in the technical description for each element type.

The estimated work times contained within the *NRCM* incorporate the following underlying assumptions and can be found in Attachment 'B':

- The person performing the work is fully trained.
- All tools, test sets and material are readily available.
- Work operations are based on forward looking technologies and management processes.

F. Probabilities

A probability represents the percentage of time a particular work function/activity is performed when processing a particular service offering. For example, if 20% of the lines are served by non staffed central offices, the probability of travel time would also be 20%.

Probability factors are utilized in the formulation of Activity Costs as follows:

ACTIVITY COST = PROBABILITY (%) X TIME (MIN) X LABOR RATE ($) / 60 (MIN)

Attachment 'B' provides probability factor details and the associated formula for each task or activity used in the Model

Each of the activities or events in the Model could occur in a service delivery process to some degree or not at all. Therefore you will see probabilities ranging from 0-100%, or designated N/A, where an activity is part of the overall process but because it is performed by the CLEC or is a CLEC system activity, it is not part of the ILEC Activity Cost calculation.

G. Dedicated Facilities

The *NRC Model* assumes dedicated facilities exist in the plant, both inside (Dedicated Inside Plant-DIP) and outside (Dedicated Outside Plant-DOP). Long standing practices have demonstrated that it is more cost efficient to commit facilities ahead of time to facilitate rapid service activation. This is accomplished during the construction phase (i.e., building of the plant). Anticipated living units are assigned facilities in the inventory systems such as LFACS and SWITCH. The inventory systems are updated to reflect this commitment.

When customers move from one location, it is assumed that in time another customer will move into the same location. Therefore, the "disconnect" of a service is in reality a "deactivation" of service to a particular living unit, (i.e., no physical work is performed).

H. Testing

For the TSR and UNE-P local market entry scenarios, the *NRC Model* assumes that all testing will be performed by the ILEC and that the cost of this testing is recovered through recurring rates. In addition, the *NRC Model* assumes that the CLEC will be responsible for the testing of customer loops once the customer is terminated on the CLEC switch. Problems reported by the customer could be verified and located using the new entrant's Mechanized Loop Testing system (MLT). If the problem was in the new entrant's equipment the new entrant would repair it. If the trouble was determined to be outside of the new entrant's local switch and collocated equipment, it would be referred to the ILEC. Any other information that would be required by the ILEC could be obtained from the new entrant's test center.

In addition, it is assumed that special service circuits will be tested prior to "turn-up". These costs have been accounted for in the *NRC Model*.

IV. Data Inputs

This section provides a description of the data inputs used by the *NRC Model.*

A. Input Fields

1. NRC Element type

This input variable allows the user to cost out individual NRC element types. There are 49 element types to select from (see Attachment A). It is expected that other element types will be added in the future.

2. State Selection

The user is able to choose a state jurisdiction to model. State selection is intended to drive the appropriate labor rates for that particular state.

3. Manual Labor Rates ($ per hour)

When the state selection is made, the model provides an input screen containing the labor rates for that particular run. This screen can be used to modify the default labor rates contained in the model.

4. Copper Loop Percentage

This represents the percent of lines served by straight copper as opposed to lines served by fiber (i.e., Integrated Digital Loop Carrier). The model default is 40% copper. The significance of this variable is that there are additional work steps associated with copper plant. This ratio can be user adjusted .

5. Central Office Staffed Ratio

This input variable represents the number of lines in a state that are served out of central offices which have technicians on site. The significance of this variable is that additional travel time and cost is required in order to do work in those offices that are not normally staffed. For example, service orders may require a technician to be dispatched for work

to be completed at a non staffed office. As the default ratio, the NRC Model assumes that 80% of the lines in a state are served by staffed central offices.

6. Average Trip Time

This variable accounts for the travel time of a technician. These technicians may need to periodically make trips to the field to rearrange outside plant, or will need to travel to the non-staffed central offices to complete various work activities such as customer orders, on-going maintenance, etc. The Work Management OSS will schedule and develop the work load and activities for the traveling technicians. Thus, the travel time is associated with several work activities, not just one. The default value contained in the NRC Model for the travel time is 20 minutes.

7. Average Setup Time

This user adjustable variable accounts, as an example, for the time associated with setting up cones while working at the Feeder Distribution Interface (FDI) or the Service Area Interface (SAI). A default value of 10 minutes is used in the Model.

8. Number of Work Activities Per Order (central office)

The average number of work activities is set at four. The default assumption is that the technician will complete four work activities.

9. Percentage Dedicated Facilities

This input represents the percentage of dedicated facilities for POTS type service. A default of 100% is used in the model. As indicated in the model by an "R," any cost associated with dedicated facilities should be recovered via recurring rate elements.

10. Variable Overhead (%)

This input represents the loading variable overhead expenses not already captured in the model. The default is 10.4% and is derived from Hatfield Model support documentation.